SONY

3-856-296-22(1)

Stereo Cassette Deck

Operating Instructions

TC-KA2ES
TC-KE600S

© 1996 by Sony Corporation

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet.
Refer servicing to qualified personnel only.

FOR THE CUSTOMERS IN THE UNITED STATES

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Owner's record

The model and serial numbers are located on the rear of the unit. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. TC-KA2ES / TC-KE600S
Serial No. _____

INFORMATION

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

— Reorient or relocate the receiving antenna.
— Increase the separation between the equipment and receiver.
— Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
— Consult the dealer or an experienced radio/TV technician for help.

CAUTION

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Welcome!

Thank you for purchasing the Sony Stereo Cassette Deck. Before operating the unit, please read this manual thoroughly and retain it for future reference.

Features

The TC-KA2ES and TC-KE600S are provided with the following features which enable higher quality sound output:

- FET input PB amplifier
- W-core transformer
  (For details, see "Glossary" on page 14.)

About This Manual

The instructions in this manual are for models TC-KA2ES and TC-KE600S.
All illustrations in this manual show the TC-KE600S.
Please note the following distinguishing features of each model:

TC-KA2ES

- Is for sale in the U.S.A and Canada.

TC-KE600S

- Is for sale in the U.K, all European countries, Australia, and other countries.

Conventions

- Instructions in this manual describe the controls on the deck.
- The following icon is used in this manual:

Indicates useful information or tips that make a task easier.

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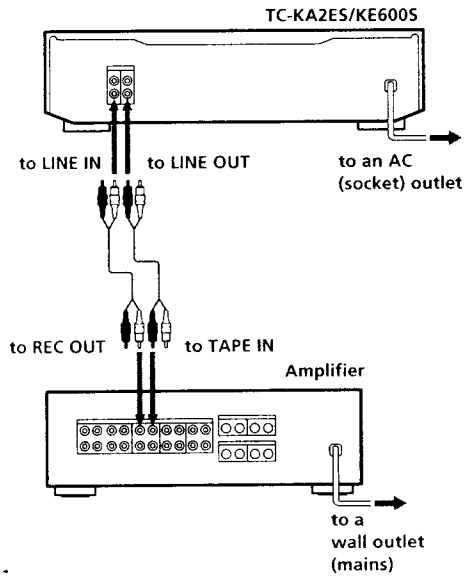
Unpacking

Check that you have received the following supplied item:

• Audio connecting cords (2)

Hooking Up the System

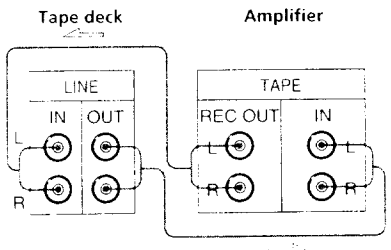
This section describes how to hook up the tape deck to an amplifier. Be sure to turn off the power of each component before making the connections.



Hookups

When connecting an audio connecting cord, be sure to match the color-coded cord to the appropriate jacks on the components: Red (right) to Red and White (left) to White. Be sure to make connections firmly to avoid hum and noise.

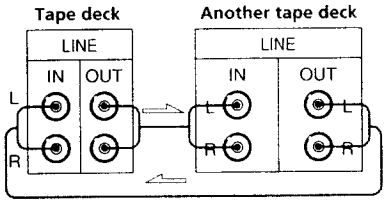
Connect the tape deck to the amplifier as shown below.



:Signal flow

To connect your tape deck to another tape deck

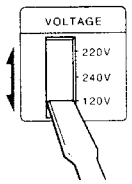
Connect both tape decks as shown below.



:Signal flow

Setting the voltage selector (only on models supplied with a voltage selector)

Check that the voltage selector on the rear panel of the tape deck is set to the local power line voltage. If not, set the selector to the correct position using a screwdriver before connecting the AC power cord to an AC outlet.



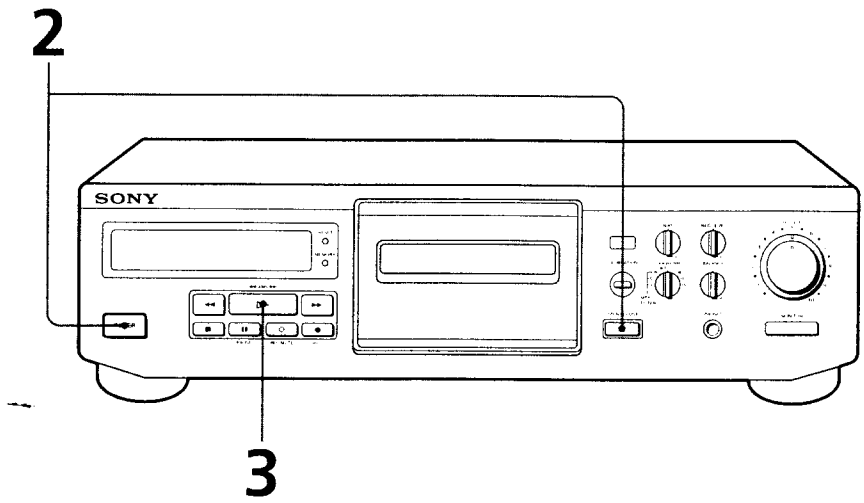
Connecting the AC power cord

Connect the AC power cord to an AC outlet.

Where do I go next?

Now you're ready to use your tape deck.
For basic operations, go to pages 5 to 7; for advanced operations, go to the sections starting from page 8.

Playing a Tape



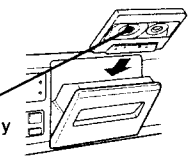
• See page 4 for hookup information.

To play a tape recorded with the Dolby NR* system
Turn DOLBY NR to the same Dolby system that the tape was recorded in—B, C, or S. Please note that the B, C, and S settings on both sides are identical during playback since the MPX filter operates only during recording.

You can connect the headphones to PHONES.

1 Turn on the amplifier and select the tape deck position.

2 Press POWER, and then press ⏏ OPEN/CLOSE and insert a cassette.


With the side you want to play facing you

3 Press ▷.

The deck starts playing. "TAPE" and the tape type (I, II, or IV) appear in the display. Adjust the volume on the amplifier.

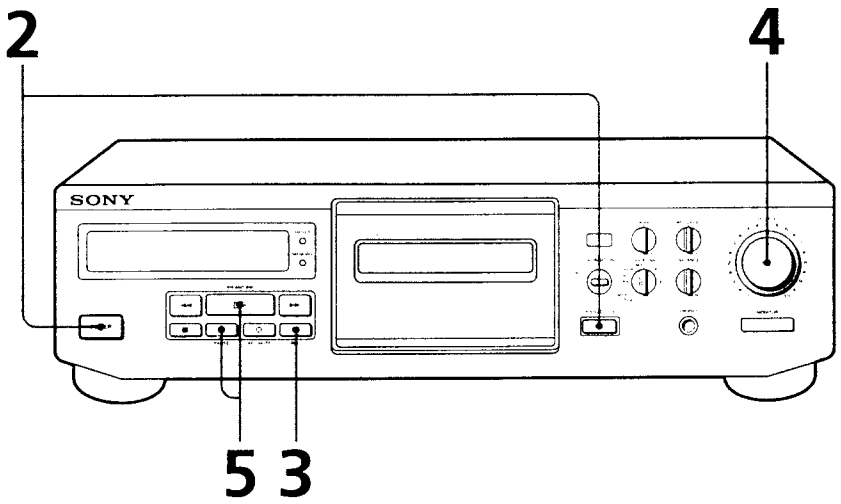
Do not press POWER while the tape deck is operating. If you do so, the tape may be damaged.

To	Press
Stop playing	■
Pause	❚❚ PAUSE. Press the button again to resume play.
Fast-forward or rewind	▶▶ or ◀◀ when the deck is stopped
Increase the tape fast-forward or rewind speed	▶▶ or ◀◀ again during fast-forwarding or rewinding
Take out the cassette	⏏ OPEN/CLOSE after stopping playing

* Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.

"DOLBY" and the double-D symbol ⧈ are trademarks of Dolby Laboratories Licensing Corporation.

Recording on a Tape



• See page 4 for hookup information.

To protect recordings against accidental erasure
Break out the record-protect tab(s) (see page 11).

1 Turn on the amplifier and play the program source you want to record.

2 Press POWER, and then press ⏏ OPEN/CLOSE and insert a cassette.

3 Press ● REC.

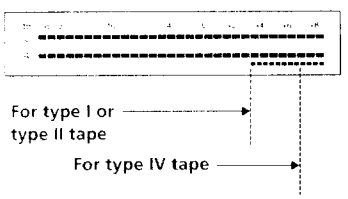
"SOURCE" and the tape type (I, II, or IV) appear in the display.

Do not press POWER while the tape deck is operating. If you do so, the tape may be damaged.

4 Turn REC LEVEL to adjust the recording level.

The recording level should not exceed the recommended level for the indicated tape type.

After doing the all adjustments, stop playing the program source.

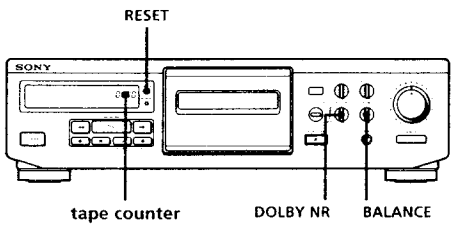


5 Press ❚❚ PAUSE or ▷.

Recording starts.

6 Start playing the program source.

To	Press
Stop recording	■
Pause	❚❚ PAUSE. Press the button again to resume recording.
Take out the cassette	⏏ OPEN/CLOSE after stopping recording



To adjust the recording balance

Turn BALANCE so that the L (left channel) and R (right channel) peak level meters in the display are at the levels you want.

To record with the Dolby NR system

Turn DOLBY NR clockwise to the position you want (B, C, or S) before you start recording.

If you cannot get satisfying results when recording FM broadcasts with Dolby NR system

Turn DOLBY NR counterclockwise to the position you want (B, C, or S with MPX FILTER) before you start recording. The filter turns on to make the Dolby NR system work more effectively. "FILTER" appears in the display. (For details on the MPX filter, see "Glossary" on page 14.)

The Dolby HX PRO* system automatically works during recording

You can check how much blank remains on the tape

1 Locate the end of the recorded portion on the tape.
2 Press RESET to reset the tape counter to "0.00."
3 Press ▶▶ to fast-forward the tape to its end.
The tape counter shows the approximate amount of remaining time.

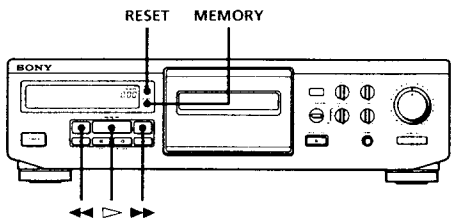
* HX Pro headroom extension originaled by Band & Olufsen and manufactured under license from Dolby Laboratories Licensing Corporation.

"DOLBY," the double-D symbol ⊡⊡ and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

For details on DOLBY HX PRO, see "Glossary" on page 14.

Locating a Track (Multi-AMS/ Auto Play/Memory Play)

You can locate the following/previous tracks (Multi-AMS: Automatic Music Sensor) or the beginning of a tape quickly. You can even locate a specific point anywhere on a tape.



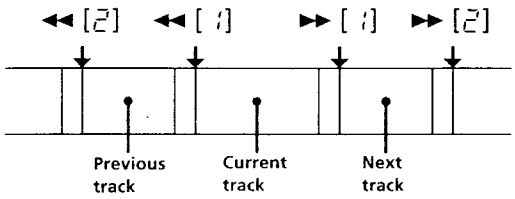
To locate	Press
the beginning of the next or succeeding tracks (Multi-AMS*)	▶▶ as many times as you want while playing. For example, to locate 2 tracks ahead, press twice.
the beginning of the current track (Multi-AMS*)	◀◀ once while playing
the beginning of the preceding tracks (Multi-AMS*)	◀◀ as many times as you want while playing. For example, to locate 2 tracks behind, press three times.
the beginning of a tape (Auto Play)	MEMORY repeatedly until "MEMORY" disappears in the display. Then press ◀◀ while holding down ▷.
a particular point on a tape (Memory Play)	MEMORY repeatedly until "MEMORY" appears in the display. Find the point you want, and press RESET to reset the tape counter and to memorize the point. To locate the memorized point, press ◀◀ while holding down ▷. (Press ◀◀ only to stop at "0.00.")

* You can use the Multi-AMS to locate up to the 30th track after or before the current track.

What happens during Multi-AMS operation

When Multi-AMS is operating, "PLAY" appears. And each time the deck detects a blank space, the indicated number decreases by one. After locating the beginning of the specified track, the counter indication appears again and the deck starts playing the track.

↓: Beginning of track

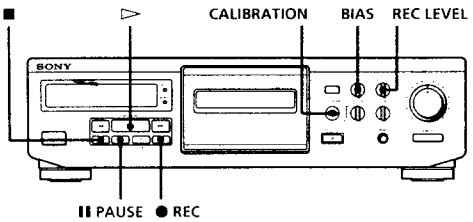


Notes

- The Multi-AMS function may not work correctly if:
  - — the blank space between tracks is less than 4 seconds long.
  - — the signal strength of the left and right channels are very different.
  - — there is a passage of low frequencies or very low volume within a track.
- Since the counter is not a digital clock, it will differ from the actual elapsed playback or recording time.

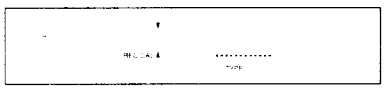
Adjusting Bias and Recording Level Calibration

Since there are many different types of cassettes on the market, the tape deck automatically sets the appropriate equalization characteristics and bias current for each tape type (ATS: Automatic Tape Selection).
However, you can get better recording results by adjusting the bias current and recording level calibration.



1 Insert the cassette you want to record on.

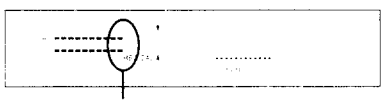
2 Press CALIBRATION.
The display for adjusting the bias current and recording level calibration appears.



3 Press ● REC.

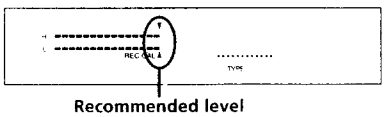
4 Press II PAUSE or ▷ to record the test tones. (You can't hear the test tones.)
After two or three seconds, the meters showing the level of the test tones appear in the display. Then adjust, in sequence, the bias current and recording level calibtation.

5 Adjust BIAS so that both meters indicate equal signal levels.
If the upper meter shows a higher level than the lower meter, turn BIAS clockwise.
If the lower meter shows a higher level than the upper meter, turn BIAS counterclockwise.



Equal signal level

6 Adjust REC LEVEL so that both meters reach the recommended level.
Turn REC LEVEL clockwise to increase both meters.
Turn REC LEVEL counterclockwise to decrease both meters.



Recommended level

Repeat steps 5 and 6 if necessary.

7 Press ■, then press CALIBRATION to stop recording the test tones.
The display returns to normal.

8 Rewind the tape and start the actual recording.

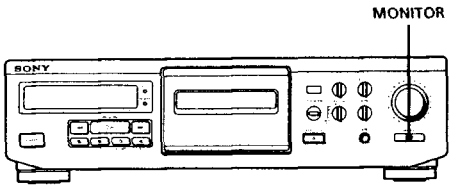
You can also adjust the bias current and recording level calibration according to your own taste
For details, see pages 14 and 15.

Notes

- Because the meters use a wider amplitude during tape calibration, they are more sensitive to slight changes in signal level.
- When you use metal (type IV) tapes, the frequency response to adjustments of the bias current is small. Therefore, adjusting the bias current with the range of this tape deck (a range of about ±20%) may not be effective.

Monitoring the Recorded Sound

You can compare the quality of the recorded sound with the sound of the program source while recording.

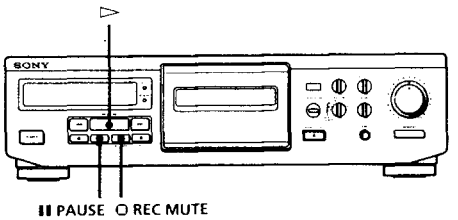


While recording, press MONITOR repeatedly until "TAPE" appears in the display.
You can monitor the sound being recorded.

To listen to the sound of the program source
Press MONITOR repeatedly until "SOURCE" appears in the display.

Inserting a Blank Space During Recording (Record Muting)

You can insert a blank space of 4 seconds between each track. The blank spaces between tracks let you locate the track easily with the Multi-AMS function (see page 8). Also, use this function to eliminate only unwanted portions on the tape.



1 Start recording.

2 Press O REC MUTE once when you want to insert a blank space.
"REC" in the display starts flashing and the tape moves on without recording any signals.
After 4 seconds, "II" lights up and the tape deck is now ready to resume recording.

3 Press II PAUSE or ▷ to resume recording.

To insert a blank space longer than 4 seconds
Hold down O REC MUTE as long as you want. After 4 seconds, "REC" flashes faster.
When you release the O REC MUTE, "II" lights up and the tape deck is ready to resume recording.
Press II PAUSE or ▷ to resume recording.

To insert a blank space of less than 4 seconds
After pressing O REC MUTE, press II PAUSE at any time. The deck changes to recording pause. To resume recording, press ● REC instead of II PAUSE.

Precautions

On safety

- Do not disassemble the cabinet — this may result in an electrical shock. Refer servicing to qualified personnel only.
- Should any solid object or liquid fall into the cabinet, unplug the tape deck and have it checked by qualified personnel before operating it any further.

On power sources

- Before operating the tape deck, check that the operating voltage of the tape deck is identical with your local power supply. The operating voltage is indicated on the nameplate at the rear of the tape deck.
- The unit is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet, even if the unit itself has been turned off.
- If you are not going to use the tape deck for a long time, be sure to disconnect the tape deck from the wall outlet. To disconnect the AC power cord (mains lead), grasp the plug itself; never pull the cord.
- AC power cord must be changed only at the qualified service shop.

On operation

- Because of a safety mechanism, the function buttons will not operate if the cassette holder is not completely closed, if there is no cassette in the cassette holder, or if a cassette has been incorrectly inserted into the cassette holder.
- Be sure to stop the tape before turning off the tape deck. Otherwise, the tape may be damaged.

On placement

- Place the tape deck in a location with adequate ventilation to prevent heat build-up in the tape deck.
- Do not place the tape deck:
  - — on a soft surface such as a rug that might block the ventilation holes on the bottom.
  - — in a location near heat sources.
  - — in a place subject to direct sunlight.
  - — in an inclined position.
  - — in a place subject to excessive dust or mechanical shock.

On cleaning the tape deck

Clean the cabinet, panel and controls with a soft cloth slightly moistened with a mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzine.

If you have any questions or problems concerning your tape deck, please consult your nearest Sony dealer.

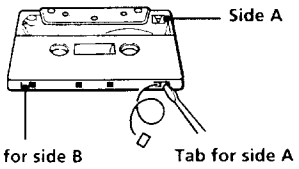
For the customers in the U.S.A.

For detailed safety precautions, see the leaflet "IMPORTANT SAFEGUARDS."

Notes on Cassette Tapes

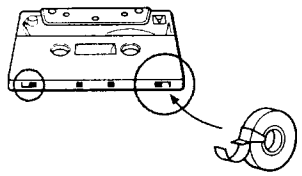
To protect the recording

Break off the record-protect tab for side A or B.

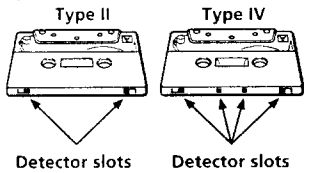


To record on a tape having a broken tab

Cover the record-protect tab hole for side A or B with adhesive tape.



When you are using a type II or type IV tape, be careful not to cover the detector slots that the deck uses to determine the tape type.



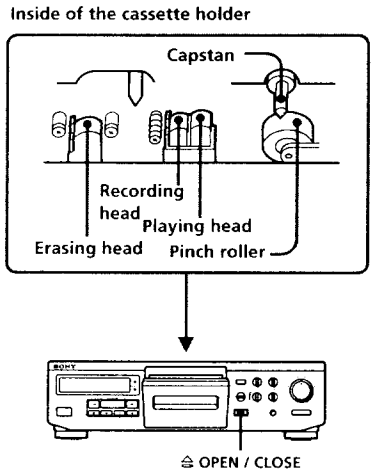
On tapes longer than 90 minutes

We do not recommend the use of tapes longer than 90 minutes except for a long continuous recording or playback. They are very thin and tend to be stretched easily.

On handling cassettes

- To prevent the heads and tape path from getting dirty, avoid touching the tape surface of a cassette.
- Place cassettes away from equipment with magnets, such as speakers and amplifiers; it may cause tape distortion or erase the recordings.
- Do not expose cassettes to direct sunlight, extremely cold temperature or moisture.

Cleaning



Cleaning the heads and tape path

Clean the heads and tape path of the tape deck after every 10 hours of operation to guard against:

- a decrease in sound level
- excessive wow or flutter
- sound dropout
- incomplete erasure

To ensure better recording, we recommend that you clean the heads and tape path before every recording.

1 Press POWER while holding down ⏏ OPEN/CLOSE. The holder opens, the heads rise, and the pinch rollers begin to rotate.

2 Wipe the heads, the pinch rollers, and the capstans with a cotton swab slightly moistened with alcohol or a commercially available cleaning fluid for tape decks.

3 When completed, press ⏏ OPEN/CLOSE. Do not insert a cassette until the cleaned areas are completely dry.

Demagnetizing the heads

After 20 to 30 hours of use, or when you notice a hissing sound or loss of high frequencies, demagnetize the heads with a commercially available demagnetizer for tape decks. Please refer to the instructions of the demagnetizer.

Troubleshooting

If you've experienced any of the following difficulties while using the tape deck, use this troubleshooting guide to help you remedy the problem. Should any problem persist, consult your nearest Sony dealer.

The cassette holder does not close.

➡ Reinsert the AC power cord, then close the cassette holder.

The function buttons do not work.

➡ The tape deck has just been turned on and does not operate for about 3 seconds. Wait until "▮▮" stops flashing.

➡ Check that the cassette is inserted correctly and the cassette holder is closed completely.

The tape stops before the tape has been fully rewound.

➡ The tape is slack. Take up the tape slack.

➡ If "MEMORY" is shown in the display, press MEMORY repeatedly until the indication disappears.

➡ The cassette shell is bent. Use another cassette.

The tape deck does not play or record.

➡ The tape has reeled to the end.

➡ The tape is slack. Take up the tape slack.

➡ The record-protect tab has been removed from the cassette. Cover the slot with tape (page 11).

➡ Clean the heads and tape path and demagnetize the heads (page 12).

➡ Check that the tape deck is properly connected (page 4).

➡ Make sure the amplifier is correctly set.

There is excessive wow, flutter, or a sound dropout.

➡ The capstans and pinch rollers are dirty. Clean them (see page 12).

There is a decrease in sound level or a sound dropout./ The tape does not erase completely./Noise increases.

➡ The heads and tape path are dirty. Clean them (see page 12).

➡ The heads are magnetized. Demagnetize them (see page 12).

There is hum or noise.

➡ The tape deck is placed near a TV or VCR. Place the tape deck away from the TV or VCR.

➡ The tape deck is placed on or under the amplifier. Place the tape deck away from the amplifier.

There is an unbalanced tone.

- ➡ Check that the DOLBY NR control is set to the position where the tape was recorded.
- ➡ The tape deck is placed near a TV or VCR. Place the tape deck away from the TV or VCR.

The Multi-AMS function does not work properly.

- ➡ One of the tracks contains a long pause, a passage of low frequencies or very low volume, or a gradual increase or decreace in volume.
- ➡ The space before a track is less than 4 seconds long. Insert a blank space of 4 seconds using ○ REC MUTE button.
- ➡ The signal strength of the left and right channels are very different.
- ➡ There is noise in the space before a track.
- ➡ You pressed ▶▶ button immediately before the next track, or ◀◀ button immediately after the beginning of the current track.

The High-Speed Fast-Forwarding and Rewinding functions do not work.

- ➡ You pressed ▶▶ (or ◀◀) when there is little tape remaining in that direction. This is to protect the tape.
- ➡ To protect the tape, the high-speed fast-forwarding or rewinding function may operate for only a short time or not at all when activated in the middle of the tape.

Specifications

System

Recording system
4-track 2-channel stereo

Fast winding time (approx.)
90 sec. (with Sony C-60 cassette)

High-speed fast-winding time (approx.)
45 sec. (with Sony C-60 cassette)

Bias
AC bias

Heads
Erasing head × 1 (S&F head)
Recording head × 1 (SD head)
Playing head × 1 (SD head)

Motors
Capstan motor × 1 (DC servo motor)
Reel motor × 1 (DC motor)
Assist (mechanism drive) motor × 1 (DC motor)

Signal-to-noise ratio (at peak level, weighted, and with Dolby NR off)
Type I tape, Sony Type I (NORMAL): 61 dB
Type II tape, Sony Type II (HIGH): 59 dB
Type IV tape, Sony Type IV (METAL): 57 dB

S/N ratio improvement (approximate values)
With Dolby B NR on: 5 dB at 1 kHz, 10 dB at 5 kHz
With Dolby C NR on: 15 dB at 500 Hz, 20 dB at 1 kHz
With Dolby S NR on: 10 dB at 100 Hz, 24 dB at 1 kHz

Harmonic distortion
0.4% (with Type I tape, Sony Type I (NORMAL): 160n Wb/m 315 Hz, 3rd H.D.)
1.5% (with Type IV tape, Sony Type IV (METAL): 250n Wb/m 315 Hz, 3rd H.D.)

Frequency response (Dolby NR off)
Type I tape, Sony Type I (NORMAL):
15 - 17,000 Hz (±3 dB, IEC)
10 - 19,000 Hz (±6 dB)
Type II tape, Sony Type II (HIGH):
15 - 18,000 Hz (±3 dB, IEC)
10 - 20,000 Hz (±6 dB)
Type IV tape, Sony Type IV (METAL):
15 - 21,000 Hz (±3 dB, IEC)
15 - 16,000 Hz (±3 dB, –4dB recording)
10 - 22,000 Hz (±6 dB)

Wow and flutter
±0.065% W. Peak (IEC)
0.045% W. RMS (NAB)
±0.12% W. Peak (DIN)

Inputs

Line inputs (phono jacks)
Sensitivity: 0.16 V
Input impedance: 47 kilohms

Outputs

Line outputs (phono jacks)
Rated output level: 0.5 V at a load impedance of 47 kilohms
Load impedance: Over 10 kilohms

Headphones (stereo phone jack)
Output level: 0.25 mW at a load impedance of 32 ohms

General

Power requirements

Where purchased	Power requirements
U.S.A. and Canada	120 V AC, 60 Hz
U.K., Continental Europe, and certain countries in Asia	220 - 230 V AC, 50/60 Hz
Australia	240 V AC, 50 Hz
Other countries	120, 220, or 240 V AC, 50/60Hz adjustable with the voltage selector

Power consumption
21W

Dimensions (approx.) (w/h/d)
430 × 120 × 310 mm (17 × 4 3/4 × 12 1/4 inches) incl. projecting parts and controls

Mass (approx.)
4.6 kg (10 lbs 2 oz)

Supplied accessories
Audio connecting cords (2)

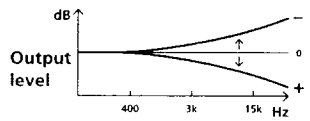
Optional accessory
Remote commander RM-J710
For more information on the availability of the remote commander, contact your nearest Sony dealer.

Design and specifications are subject to change without notice.

Glossary

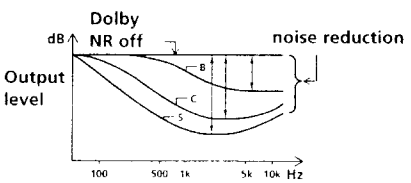
ATS
Automatic Tape Selection. The tape deck automatically sets the appropriate equalization characteristics and bias current according to the tape type inserted in the deck.

Bias calibration
Adjustment for optimum recording. You can get better recording results with minimum distortion and flat frequency response by adjusting the bias current to the appropriate level. Lowering the bias current can boost high-frequency response, but also cause higher distortion. On the other hand, raising the bias current can minimize distortion, but also reduce high-frequency response. To balance both the bias current and high-frequency response, it is necessary to adjust the bias current appropriately.
However, to suit your taste, you can also adjust the bias current as you want.



Dolby HX PRO system
Distortion and noise reduction system. The Dolby HX PRO system reduces distortion and noise in high-frequency response while recording. A tape recorded with this system brings the same high-quality sound even when you play the tape on the other tape decks.

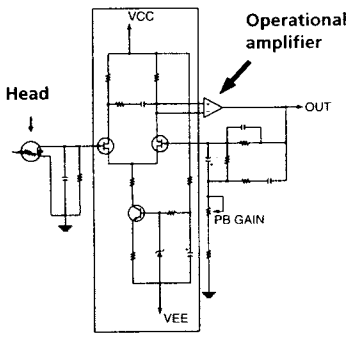
Dolby NR (noise reduction) system
Noise reduction system for eliminating hissing noise. The Dolby NR system boosts the low-level signals in high frequency during recording and restores them during playback.
There are 4 types in the Dolby NR system: A, B, C and S. A-type is for professional use (not available on this tape deck), and B, C and S-types are for consumer use. S-type has the maximum noise reduction capability, followed by C and B.



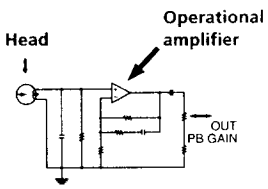
FET input PB amplifier

The FET input PB amplifier is a circuit that is positioned between the playing head and the operational amplifier. Unlike conventional amplifier circuits, which require a low noise, medium-quality operational amplifier because of its direct link with the playing head, the noise-free signal that the FET input PB amplifier provides enables the use of a higher quality operating amplifier, and more natural sounding output.

New Amplifier



Conventional Amplifier



MPX filter

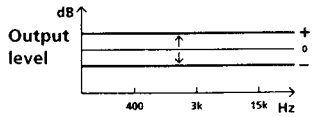
Multiplex filter. A filter for eliminating the 19-kHz stereo carrier and the 38-kHz sub-carrier signals that may impair the Dolby NR system. Usually the tuner has an MPX filter. If you cannot get a satisfying result when recording FM broadcasts with Dolby NR system, your tuner does not have a filter or the filter is not working. In this case, turn the DOLBY NR switch countercolckwise to the position you want (B, C, or S with MPX FILTER).

Multi-AMS

Multi-Automatic Music Sensor is a function that locates the beginning of 30 tracks before or after the current track by detecting a blank space (of over 4 seconds) between tracks.

Recording level calibration

Adjustment for optimum recording. Even when you have adjusted the recording level correctly, the playing level might turn out to be low depending on the tape used. By adjusting the recording level calibration, you can compensate for the low recording level. When you record on a tape with the Dolby NR system, this function works more effectively.



Tape counter

A display element that shows the elapsed recording or playing time as a digital readout. Since the counter is not a digital clock, the displayed value will differ slightly from the actual elapsed recording or playing time. The counter value also includes the length of the leader tape.

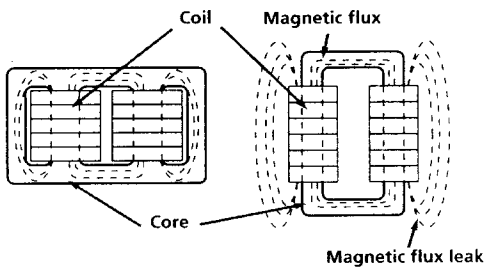
Test tones

10-kHz and 400-Hz signals produced by the tape deck when you do the bias and recording level calibration.

W-core transformer

A transformer that uses an inner and outer core to minimize magnetic flux leakage, thereby improving sound quality. The coil is wound around the inner core and surrounded by the outer core which acts to suppress magnetic flux leakage.

New Transformer **Conventional Transformer**



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